

***Detailed Action***

***Response to Amendment***

1. Applicant's Remarks/Arguments filed on 3/30/2009 regarding claims 25-28, 30-41, 43-53 have been fully considered. Claims 1-24, 29, 42 have been canceled by applicant. Claims 25-28, 30-41, 43-53 are currently pending.

***EXAMINER'S AMENDMENT***

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with applicant's representative, Ms. Denise Wong, on 6/1/2009.

The application has been amended for claims 25-26, 28, 30-36, 39, 52 as follows:

Claim 25 (Currently amended): An apparatus for Transmission Control Protocol (TCP) flow control of data from a transmitting end to a receiving end via an intermediate element comprising a transmit buffer in a communication system, the apparatus comprising:

~~logic~~ a processor for determining delay in the transmit buffer; and  
~~logic for modifying TCP window size operably coupled to the logic for determining~~  
~~delay~~ and configured to modify TCP window size based on the determined delay and a target transmit buffer delay.

Claim 26 (Currently amended): The apparatus of claim 25, wherein the processor ~~logic~~ for modifying TCP window size comprises ~~means for~~ sending an indication of modified TCP window size to the transmitting end of the communication system.

Claim 28 (Currently amended): The apparatus of claim 26, wherein the processor ~~logic~~ for sending an indication of modified TCP window size is configured to send the indication of modified TCP window size in an acknowledge packet.

Claim 30 (Currently amended): The apparatus of claim 25, wherein the processor ~~logic~~ for modifying TCP window size modifies the TCP window size as a function of the determined transmit buffer delay and a previously determined TCP window size.

Claim 31 (Currently amended): The apparatus of claim 25, wherein the processor logic for modifying TCP window size modifies the TCP window size as a function of the determined transmit buffer delay and a function of control loop gain.

Claim 32 (Currently amended): The apparatus of claim 25, wherein the processor logic for modifying TCP window size comprises means for determining a number of received acknowledge packets.

Claim 33 (Currently amended): The apparatus of claim 32, wherein the processor logic for modifying TCP window size is configured to further modify TCP window size in response to the logic determining a number of received acknowledge packets determining a number of acknowledge packets equal to half of a current number of data units in the system.

Claim 34 (Currently amended): The apparatus of claim 25, wherein the processor logic for determining delay in the transmit buffer comprises ~~means for~~ determining mean buffer delay of a plurality of data units passing through the transmit buffer and ~~the logic for~~ modifying TCP window size modifies TCP window size as a function of the mean buffer delay.

Claim 35 (Currently amended): The apparatus of claim 34, wherein the processor logic for modifying TCP window size is arranged to modify TCP window size if the mean buffer delay is within a predetermined range about a target delay, by an amount related to a difference between the mean buffer delay and the target delay.

Claim 36 (Currently amended): The apparatus of claim 34, wherein the processor logic for modifying TCP window size is arranged to modify TCP window size if the mean buffer delay is outside a predetermined range about a target delay, by an amount related to a difference between a current mean buffer size and a predetermined value.

Claim 39 (Currently amended): A method for Transmission Control Protocol (TCP) flow control of data from a transmitting end to a receiving end via an intermediate element comprising a transmit buffer in a communication system, the method comprising:  
a processor for determining delay in the transmit buffer; and

modifying TCP window size based on the determined delay and a target transmit buffer delay.

Claim 52 (Currently amended): A computer-readable medium encoded with executable instructions, ~~the instructions comprising instructions for~~ that when executed will:  
~~determining~~ determine delay in the transmit buffer; and  
~~modifying~~ modify TCP window size based on the determined delay and a target transmit buffer delay.

***EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE***

3. The following is an examiner's statement of reasons for allowance:

The present application relates to providing a method and apparatus for Transmission Control Protocol (TCP) flow control of data from a transmitting end to a receiving end via an intermediate element comprising a transmit buffer in a communication system, including the unique steps of:

“configured to modify TCP window size based on the determined delay and a target transmit buffer delay.”

The closest prior art, Jung et al. (USP 7,054,317), discloses a method for determining TCP congestion windows size based on the estimated round trip delay RTT . However, Jung fails to anticipate or render obvious the above quoted limitations of the present application. This renders the claims allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

*Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on 571-272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. M./  
Examiner, Art Unit 2416

/Chi H Pham/  
Supervisory Patent Examiner, Art Unit  
2416  
6/4/09